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Study of the antifungal activity of lactic acid bacteria isolated from fermented cassava and Mill flour

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Moulds and yeasts are common spoilage organisms of food products and are responsible of to 10 % of world's food lost despite the various preservation techniques applied. A few studies have reported that some lactic acid bacteria (LAB) may have antifungal activity in food product through the production of phenyllactic acid, cyclic dipeptides, 3-hydroxy fatty acids and peptides. The aim of this research was to study the antifungal properties of 116 LAB isolated from fermented Cassava flour and mill.

111 lactic acid bacteria were selected for their antifungal activity in solid medium against *Aspergillus niger* MUCL 28699, *Aspergillus flavus* MUCL 20417, *Candida albicans* MUCL 30112, *Fusarium poae* MUCL 42824, *Penicillium expansum* MUCL 14497 and two unidentified moulds isolated from yoghurt and bread.

The ability of the strains to produce antifungal compounds during their growth in MRS liquid medium was studied. On the basis of the antifungal activity of the concentrated cell-free supernatant at different pH (4±0.2, 5 and 6), 21 strains were selected. To assess that the antifungal activity was not due to lactic or acetic acid produced by LAB, their minimal inhibitory concentration (MIC) was determined as well as their concentrations in the concentrated cell free supernatants. The MIC was higher than the concentration of the acid in the concentrated supernatant showing that they were not responsible of the antifungal activity. In addition, the concentration of the organic acids was not different between the antifungal strains and the LAB strains without activity.

One strain, *Lactobacillus plantarum* VE56, was chosen for further studies on the basis of its antifungal activity. The antifungal products are hydrophobic as showed by SPE-C18 extraction from the supernatant. HPLC-ESI-MS analysis showed that phenyllactic acid is present in the supernatant at a concentration of 0.52 mM. Further studies are necessary to show if other antifungal compounds, like 3-hydroxy fatty acid or peptides, are present. The antifungal activity of the strains will also be studied in food products like bread and fermented milk.